25
22
20
28
32
36
40
100 mm
1.0
1.1
1.25
1.4
1.6
2.8
3.2
3.6
4.0
2.5
2.2
2.0
1.8
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890
1.0 mm
1.5 mm
2.0 mm
A5

ED313840

WAIS-R VERBAL AND PERFORMANCE PROFILES OF ADOLESCENTS REFERRED FOR ATYPICAL LEARNING STYLES

Pamela Rush
School of Preparatory Studies
Gallaudet University

Lynne Blennerhassett, Ed.D.
Associate Professor
Gallaudet University

David Alexander
School of Preparatory Studies
Gallaudet University

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☒ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Pamela Rush
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Abstract

The Wechsler Adult Intelligence Scale-Revised (WAIS-R) is the most frequently used test of cognitive ability for hearing-impaired adolescents and adults. The Performance Scale has long been recognized as the most appropriate measure of intelligence for the deaf. The Verbal SCale, although not generally accepted as a measure of intelligence for the deaf, has increasingly gained acceptance as a functional measure of verbal comprehension and expression (Blennerhassett, 1985; Gibbins, 1989; Miller, 1984; Spragins and Gibbins, 1982). Previous research has shown that mean Verbal Scale scores of deaf students tend to be approximately one standard deviation below the mean scores of hearing peers (Blennerhassett, 1987; Goetzinger, Ortiz, Bellrose, and Buchan, 1966; Hine, 1970; Kohoutek, Pulda, and Zemanova, 1971). Differences within the deaf population have also been reported on the Verbal Scale, with deaf adolescents of deaf parents scoring significantly higher than deaf adolescents of hearing parents (Blennerhassett, 1987; Blennerhassett, Moores, Hannah and Woolard, 1988). Differences in the factorial structure of the WAIS-R were also documented between these two groups (Blennerhassett, Moores, and Anderson, 1988).

The primary purpose of this study was to investigate WAIS-R profiles of deaf adolescents referred for academic difficulties. In addition, differences between referral deaf students and non-referral deaf peers were explored. The sample consisted of severely-to-profoundly hearing impaired students enrolled in the School of Preparatory Studies at Gallaudet University. All participants were referred to the Office of Diagnostic and Support Services because of significant, atypical learning problems. Both Verbal and Performance Scales of the WAIS-R were administered in sign language.

Initial investigation of protocols for this referral population suggested a different profile of abilities compared to non-referral deaf peers. Depressed scores and atypical patterns of cognitive strengths and weaknesses were noted on both verbal and performance scales for he referral deaf population.

EC 221706

The results of this study will be used to determine directions for further research relating to cognitive deficiencies and/or cognitive differences of deaf students experiencing academic difficulties. The relevance of specific subtests in differential diagnosis will be discussed. Implications for practitioners are indicated, specifically with reference to educational recommendations.

Introduction

It is estimated that 6% to 8.6% of hearing-impaired children and youth experience specific learning disabilities not attributed to mental retardation, emotional/behavioral problems, or other sensory/health impairments (Center for Assessment and Demographic Studies, 1988; Craig and Craig, 1987). In one survey, 23% of a sample of over 7,500 hearing-impaired students were identified as learning disabled (Elliot, Powers and Funderburg, 1988).

Although these atypical learners represent the largest segment of the multi-handicapped hearing-impaired students, there are no specific definitions or agreed-upon criteria to identify this special population. However, practitioners experienced with this population report the presence of atypical learning characteristics including problems with memory, sequencing, sensory integration, fine/gross motor coordination, visual/tactile/kinesthetic processing, attention, and acquisition of non-verbal and verbal language that differs from that of hearing-impaired peers (Funderburg, 1982; Rowell, 1987). In a national survey of programs which served 11,057 hearing-impaired students, atypical deaf learners were differentiated from non-referral students on nine criteria: memory difficulties; attentional problems; perceptual problems; discrepancy between achievement and potential; language problems; unique learning styles; poor organizational skills; secondary behavior problems; and inconsistent performance (Powers, Elliot and Funderburg, 1987). In another national survey, Elliot and his colleagues (1988) identified five criteria unique to this population: processing problems; memory problems; atypical language problems; discrepancy between IQ and achievement; and behavior problems.

Identification of atypical deaf learners is difficult due to lack of instrumentation and variability in rater judgements (powers, Elliot, Fairbank, and Monaghan, 1988). Kachman and Rush (1988) recommend a multidisciplinary team approach, stressing that school psychologists, teachers, language/communication specialists, and audiologists should pool data from their collective observations and formal/informal assessments. They stress the need for evaluators who are familiar with the effects of hearing impairment on language acquisition and achievement in order to discriminate atypical hearing-impaired learning styles.

For hearing populations, the Verbal and Performance Scales of the Wechsler Intelligence Tests have been identified as tools which aid in the discrimination of atypical learners. Kaufman (1979) identified the Freedom from Distractibility cluster, (made up of the Arithmetic, Digit Span, and Coding subtests) as low score groupings for hearing students with attentional and learning problems. Several studies report that the Distractibility cluster discriminates learning-disabled hearing students from their non-disabled peers (Lombard, 1978; Stedman, Cortner, Lawles, and Achterberg, 1978; Petersen and Hart, 1979). Groff and Hubble (1982) found the Distractibility factor to be more stable for younger students than for adolescents. Similarly, the Distractibility factor was found to be somewhat inconsistent across the ages of 6-16 years, with the Picture Arrangement subtest loading along with Arithmetic, Digit Span, and Coding (Van Hagen and Kaufman, 1975).

With hearing-impaired populations, the Wechsler Performance Scales are the most frequently used tests of intelligence: the WAIS-R administered to children between the ages of 6 to 16 years, and the WAIS-R administered to students above 16 years of age (Blennerhassett, 1985; Gibbins, 1989; Levine, 1974; Spragins and Gibbins, 1982). Studies suggest that the WAIS-R Performance Scale IQs of deaf adolescents are higher than those of hearing

adolescents, with mean Performance IQs of 107 to 109 (Balow and Brill, 1975; Blennerhassett, Moores, Hannah and Woolard, 1988). Mean Verbal IQ scores of deaf adolescents, considered measures of achievement rather than intelligence, ranged from 82 to 91, with Arithmetic subtest scores typically higher than scores on the other Verbal Scale subtests (Blennerhassett, 1987; Blennerhassett et al, 1988; Geers and Moog, 1987; Hine, 1970; Kohoutek, Pulda, and Zemanova, 1971).

The purpose of the present study was to investigate the degree to which WAIS-R Verbal and Performance Scale profiles of atypical deaf learners differ from those reported for non-referral deaf peers, and the degree to which the test profiles of atypical deaf students resemble those reported for atypical hearing students.

Method

Subjects

The sample consisted of 28 hearing-impaired students between the ages of 18-23 years, enrolled at Gallaudet University. Twenty-six of the students were enrolled as Preparatory students; two were Freshmen. All students in the sample had been referred by teachers and/or academic advisors because of atypical learning styles which were interfering with classroom achievement. All referring teachers and academic advisors were experienced with hearing-impaired students and familiar with the effects of deafness on achievement and language. Mixed etiologies were represented in the sample, but none of the participants had additional health or sensory handicaps. The peer group from which the sample was referred had the following characteristics. For Preparatory students, mean reading comprehension was at the 5.3-5.7 grade level; 73% attended residential high schools and 25% attended mainstream high schools. The Freshman student body scored at the 10.0-10.4 grade level in reading

comprehension; 47% of this group attended residential high schools and 48% were from mainstream programs.

Procedure

All subjects were administered the Verbal and Performance Scales of the WAIS-R by school psychologists trained in working with the deaf. All subtests were administered according to the procedures established in the WAIS-R manual. Items were administered using a form of Pidgin Signed English (PSE).

Raw scores on the six Verbal Scale subtests and 5 Performance Scale subtests were converted to standard scores using WAIS-R norms for same-age peers. Similarly, Verbal IQ and Performance IQ scores were derived by converting raw scores to standard scores using norms for same-age peers.

Mean scores and standard deviations of the referral deaf sample were then compared to non-referral deaf scores available from previously reported research (Blennerhassett et al, 1988). Although the most appropriate comparison sample would have been non-referral Gallaudet peers matched on reading level, previous school placement, and other salient personal variables, such a control group was not available to the authors. Rather, data reported in previous research using the WAIS-R with older deaf adolescents was identified as the most appropriate comparison base available. That non-referral deaf sample consisted of 72 hearing-impaired adolescents between 16-18 years of age, who were administered the WAIS-R Verbal and Performance Scales in Pidgin Signed English. Mixed etiologies were reported, but the sample excluded students with learning problems or additional handicapping conditions. All students were from residential schools. Mean reading achievement was at the 6.0 grade level.

Results

Table 1 presents the means and standard deviations of WAIS-R Verbal and Performance scores obtained from the sample of hearing-impaired students referred for atypical learning problems. Table 1 also contains WAIS-R score profiles reported in previous research on non-referral deaf students.

The mean intelligence of deaf referral students, as measured by the Performance IQ, was 97.75. Like their hearing peers who are referred for specific learning disabilities, these hearing-impaired students scored in the average range of intelligence. The subtest cluster of Arithmetic, Digit Span, and Digit Symbol which typifies hearing learning-disabled students, did not emerge as a distinct, low-score profile for the deaf referral sample. However, scores on the Arithmetic subtest, along with Picture Completion and Picture Arrangement, were significantly lower for the referral deaf sample compared to non-referred deaf peers. For non-referred deaf students, the mean Arithmetic score of 8.12 represented the area of highest subtest performance on the Verbal Scale. For referral deaf students, the ARithmetic subtest was the only Verbal Scale subtest to differentiate between the two deaf groups, with the mean score of 6.17 for deaf referral sample significantly lower ($p < .01$). Significant differences between the deaf referral sample and the non-referral norms were noted on three Performance Scale measures. The mean Performance IQ of 97.75 for the deaf referral sample was significantly lower ($p < .01$) than the mean IQ of 109.95 for the non-referral deaf sample. Similarly, the referral deaf sample scored significantly lower on Picture Completion (mean = 9.46) and Picture Arrangement (9.57) than the non-referral deaf group who earned mean scores of 11.11 on Picture Completion and 11.73 on Picture Arrangement.

Discussion

The WAIS-R profile of scores obtained by hearing-impaired adolescents referred for atypical learning styles differed from the scores reported in previous research with non-referral deaf samples. Specifically, Performance Scale IQs of deaf referral students, although average, were found to be significantly lower than those reported in previous research. In addition, deaf referral students performed significantly lower on Arithmetic -- the Verbal Scale subtest upon which deaf students typically perform best. Significantly lower scores were also noted for deaf referral students on two Performance Scale subtests -- Picture Completion and Picture Arrangement. This subtest pair has been identified as tapping a shared ability referred to as "visual organization without essential motor activity" (Kaufman, 1979, p. 175).

The present research has implications for both assessment and remediation. Although the Wechsler Verbal Scales are not generally administered to deaf populations except for research purposes, it may be useful to standardize and include the Arithmetic subtest or (some similar measure) within diagnostic batteries. Further research is needed to determine whether or not the Arithmetic, Picture Completion, and Picture Arrangement cluster proves useful in identifying and discriminating atypical deaf learners throughout the developmental years. A larger study with a greater number of subjects representing a greater age span would be needed to conduct factor-analytic investigations into this question.

For practitioners, the observed profile of weakness in "visual organization without essential motor activity" may prove useful in designing remediation strategies for students who exhibit this profile. Incorporating essential motor activities into coursework and projects may provide a strategy for enhancing learning of such students. This action may be especially important for older students, for whom coursework is typically weighted with reading, lectures,

and other activities that are void of essential motor strategies. Further research would be needed to determine the feasibility and effectiveness of such educational modifications upon achievement.

Table 1. WAIS-R Verbal and Performance Scale Differences Between the Referral Deaf Sample and Non-Referral Deaf Peers

	Referral Deaf		Non-Referral Deaf		t Value
	Mean	S.D.	Mean	S.D.	
Verbal IQ	77.46	5.83	82.20	10.36	2.28
Performance IQ	97.75	13.09	109.95	15.46	3.69 **
Verbal Subtests:					
Information	6.46	1.89	6.97	2.66	0.92
Digit Span	6.10	2.33	6.91	2.61	1.42
Vocabulary	4.96	1.20	5.81	1.71	2.40
Arithmetic	6.17	1.80	8.12	2.84	3.35 **
Comprehension	6.25	1.75	7.34	2.20	2.34
Similarities	6.60	2.16	7.62	2.47	1.89
Performance Subtests:					
Picture Comp.	9.46	2.23	11.11	2.28	3.26 **
Pict. Arrange.	9.57	2.39	11.73	3.00	3.41 **
Block Design	10.17	2.45	12.00	3.17	2.74
Obj. Assembly	10.46	2.57	11.77	2.98	1.96
Digit Symbol	9.67	2.45	10.50	2.48	1.50

** $p < .01$

References

Balow, I.H. & Brill, R.S. (1975). An evaluation of reading and academic achievement levels of 16 graduating classes of the California School for the Deaf, Riverside. The Volta Review, 77(4). 255-266.

Blennerhassett, L. (1985, July). Report of an On-Site Survey of Current Psychoeducational and Linguistic Assessment Practices. (Available from L. Blennerhassett, Gallaudet University, Washington, D.C.)

Blennerhassett, L. (1987, March). Experimental Use of the WISC-R and WAIS-R Verbal Scales with Hearing Impaired Adolescents. Paper presented at the National Association of School Psychologists Convention, New Orleans, Louisiana.

Blennerhassett, L., Moores, D., & Anderson, B. (1988, April). Factor structure of the WAIS-R for two groups of deaf adolescents. Paper presented at the National Association of School Psychologists, Chicago, IL.

Blennerhassett, L., Moores, D.F., Hannah, J. & Woolard, L. (April, 1988). The Impact of Parental Deafness on WISC-R and WAIS-R Verbal and Performance Scores of Deaf Adolescents. Paper presented at the National Association of School Psychologists, Chicago, Illinois.

Center for Assessment and Demographic Studies. (1988). Annual Survey of Hearing Impaired Children and Youth, 1986-1987. Unpublished data. Washington, D.C.: Gallaudet University.

Craig, W.N. & Craig, H.B. (1987). Programs and services for the deaf in the United States. American Annals of the Deaf. 132(2).

Elliot, R., Powers, E., & Funderburg, R. (1988). Learning disabled hearing impaired students: Teacher survey. Paper accepted for publication, The Volta Review.

Funderburg, R. (1982). The role of the classroom teacher in the assessment of the learning disabled child. In D. Tweedie & E.H. Shroyer (Eds.). The Multihandicapped Hearing Impaired: Identification and Instruction. pp. 61-74. Washington, D.C.: Gallaudet University Press.

Geers, A.E. & Moog, J.S. (1987). Factors predictive of the development of reading and writing skills in the congenitally deaf: Report of the oral sample. (Report No. NIH-NINCDS-83-19). Washington, D.C.: National Institute of Neurological and Communicative Disorders and Strokes.

Gibbins, S. (1989). The provision of school psychological assessment services for the hearing-impaired: A national survey. Volta Review, 91(2), 95-103.

Groff, M. & Hubble, L. (1982). WISC-R factor structures of younger and older youth with low IQs. Journal of Consulting and Clinical Psychology, 50(3). 148-149.

Hine, W.D. (1970). The abilities of partially hearing children. British Journal of Educational Psychology. 40(2). 171-178.

Kachman, W. & Rush, P. (1988, April). Learning disabilities among the deaf population: Evaluation and interpretation. Paper presented at the National Association of School Psychologists. Chicago, Illinois.

Kaufman, A.S. (1970). Intelligent Testing with the WISC-R. New York: Wiley & Sons.

Kohoutek, R., Pulda, M. & Zemanova, A. (1971). A contribution to the problem of intellectual achievement in the deaf. Psychologia A Patopaychologia Dietata. 6(2). 147-154.

Levine, E.S. (1974). Psychological tests and practices with the deaf: A survey of the state of the art. The Volta Review. 76. 298-319.

Lombard, T.J. & Riedel, R.G. (1978). An analysis of the factor structure of the WISC-R and the effect of color on the Coding subtest. Psychology in the Schools. 5(2). 176-179.

Peterson, C.R. & Hart, D.H. (1979). Factor structure of the WISC-R for a clinic-referred population and specific subgroups. Journal of Consulting and Clinical Psychology. 47(3). 643-645.

Powers, A., Elliot, R., Fairbank, D. & Monaghan, C. (1988). The dilemma of identifying learning disabled hearing impaired students. The Volta Review. 90(4). 209-218.

Powers, A., Elliot, R. & Funderburg, R. (1987). Learning disabled hearing impaired students: Are they being identified? The Volta Review. 89(2). 99-105.

Rowell, E.G. (1987). Learning disabilities assessment. In H. Elliot, L. Glass & J.W. Evans (Eds.). Multiply-handicapped Assessment of Deaf Clients. San Diego: College-Hill Press.

Spragins, A. & Gibbins, S. (1982, March). Interaction effect: School psychology and deafness in training and practice. Paper presented at the National Association of School Psychologists, Toronto, Ontario.

Stedman, J.M., Cortner, R.H., Lawlis, G.F. & Achterberg, G. (1978). Relationships between WISC-R factors, Wide Range Achievement Test scores, and visual-motor maturation in children referred for psychological evaluation. Journal of Counseling and Clinical Psychology. 46(5). 869-872.

Wechsler, D. (1981). Manual for the Wechsler Adult Intelligence Scale-Revised. New York: Psychological Corporation.

Wechsler, D. (1974). Manual for Wechsler Intelligence Scale for Children-Revised. New York: Psychological Corporation.